

**REMARKS**

Applicant submits this Amendment in response to the Office Action dated April 4, 2008. Reconsideration of the subject application as amended herein is respectfully requested.

Turning first to a preliminary matter, in the Office Action the Examiner objected to the numbering of the claims, as set forth in applicant's Preliminary Amendment filed on July 9, 2004. In that Preliminary Amendment, applicant had canceled original claims 1-28, and had submitted 26 new claims, but the new claims were inadvertently numbered 1-26, rather than 29-54 as required by 37 C.F.R. §1.126. However, it appears from the Office Action that the Examiner has undertaken to renumber applicant's claims, and the Examiner is thanked for this courtesy. Nevertheless, since it is not clear whether the Examiner also amended applicant's dependent claims in order to correct the internal claim-dependency references, applicant seeks to make those amendments now.

In addition, in the Office Action it is stated that claims 29-52 are pending in this application, and it appears that the Examiner gave consideration on the merits only to claims 19-52. In other words, claims 53 and 54 were overlooked and were NOT considered on the merits, apparently because they appeared on the same page of the Preliminary Amendment as applicant's "Remarks" (although those claims were

incorrectly numbered there as claims 25 and 26), and were therefore mis-identified by the Office as forming a part of applicant's argument/remarks rather than as claims. Both correction of this Office error, as well as consideration of claims 53 and 54 on the merits by the Examiner (together with reconsideration of claims 29-52, as amended herein), are respectfully requested.

Claims 29-54 are pending in this case; claims 29 and 41, which are the only independent claims, have been amended to clarify their meaning and to improve their form. In the Office Action, the claims were rejected under 35 U.S.C. §103(a) as unpatentable over US5932086 (Kasaaian) in view of US3301777 (Leonard). Applicant respectfully traverses this rejection, as it appears that the Examiner has misperceived either Kasaaian or applicant's claimed invention (or both).

Applicant's invention involves a leaching reaction, in which the leach is achieved using sulphur dioxide gas as the leaching agent, albeit in the presence of an acid, (specifically, sulphuric acid) to keep the pH low. Thus, it is the sulphur dioxide gas that is performing the leach, not the sulphuric acid in the solution, as is made clear in the specification, page 2, lines 19 to 21, and page 7, lines 1-6.

The sulphuric acid is used only to maintain the leach solution at a pH of less than about 1.5, since as noted on page 7, lines 13-19, of the specification, higher pH values

favor the production of dithionate ions, whereas lower pH values help to minimize the formation of dithionate ions and ensure that the production of manganese sulphate (rather than manganese dithionate) becomes the predominant reaction in the leach, thereby yielding the advantages set forth on page 2 of the specification.<sup>1</sup> Claims 29 and 41 have been amended to make it more clear that an acid (sulphuric acid) is added to the leach solution simply to ensure that the pH is kept low, and that it is the volume of sulphur dioxide gas that is passed through that solution which is the actual leaching agent.

By contrast, in the prior art (Kasaian), the leach is conducted with sulphuric acid, not with sulphur dioxide. Kasaian actually describes a process of sintering of manganese dioxide ore, which is fundamentally different from the leach of the present invention. This sintering of manganese dioxide ore first converts the lower oxides of manganese contained in the ore ( $\text{MnO}_2$  and  $\text{Mn}_2\text{O}_3$ ) to manganomanganic oxide ( $\text{Mn}_3\text{O}_4$ ), by using sulphur dioxide as a reducing agent; this takes place before the  $\text{Mn}_3\text{O}_4$  is subsequently leached with sulphuric acid. As such, the prior art teaches leaching with sulphuric acid only, *not* with sulphur dioxide, which is used there only as a reducing agent.

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<sup>1</sup> As indicated elsewhere in the specification, other techniques can also be utilized to help minimize the production of dithionate ions, including effective monitoring of the oxidation-reduction potential, and of the additions of manganese dioxide and sulphur dioxide to the reaction mixture.

Thus, the Examiner's contention that the "Kasaaian patent discloses the claimed method for the hydrometallurgical processing of manganese containing materials" is incorrect. Furthermore, although the Examiner correctly points out that Kasaaian does not disclose that dithionate ions are kept at a level below 5 g/l, the Examiner's citation of the Leonard patent, allegedly to supply that "missing" element, also evinces an unfortunate misunderstanding. Leonard simply suggests, at column 4, lines 39-42, that an amount of dithionate may be "included in the electrolyte"; in other words, Leonard suggests that dithionate be introduced into the reaction mixture as a starting material, *before* the sulphur dioxide gas is passed through the mixture and the leach reaction takes place. On the other hand, in applicant's claimed method, the dithionate ions are products (or, more aptly, by-products) of the leaching reaction, as can be understood from the specification, when taken together with the use of the phrase "generated in the leach solution" in applicant's independent claim 29.

Therefore, it is the amount of dithionate formed as a reaction product, *not* the amount used as a starting material, which applicant has realized must be controlled, in the context of a leach reaction for manganese containing materials that utilizes sulphur dioxide, not sulphuric acid, as the leaching agent. As such, the combination of Kasaaian and Leonard in the manner postulated by the Examiner (that is, by "modifying" the Kasaaian disclosure with the teachings of Leonard) is inappropriate and would certainly not be a combination that a skilled worker in this field would arrive at or

consider in this context, and in any event, would not yield applicant's invention as presently claimed. There is certainly no teaching in either Kasaaian or Leonard which suggests that low levels of dithionate ion is a desirable outcome. For these reasons, the rejection of the claims under 35 U.S.C. §103(a) as unpatentable over Kasaaian in view of Leonard should be withdrawn.

Applicant has responded herein to the points raised by the Examiner in the Office Action, and applicant has amended the claims in an earnest effort to place this application in condition for allowance. Accordingly, further favorable action in connection with this patent application is earnestly solicited. The Examiner is invited to contact the undersigned attorney by telephone if it will advance the prosecution of this case.

Respectfully submitted,

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